

REMARKS

By the present amendment, the specification has been amended to clarify that the mean variation (L') of the gear ratio (L) is a sliding average, so as to clarify that the period T over which a value of the mean variation (L') is calculated is a moving time interval. Support for the changes is found in the original version of the corresponding paragraphs ("moving average... over a period T of a plurality of unit time intervals t_i ") on page 2, lines 34-35 ("steps... performed at each instant corresponding to each unit time interval"), and on page 9, lines 21-24.

Claim 1 has also been amended correspondingly to insert "sliding" before "mean variation."

Further, claim 1 has been amended to replace "lies" by "is controlled to lie," "is set with" by "has," and "at least one portion of" by "at least one operating stage in," so as to clarify that the permanent mode is such that the sliding mean variation per unit time (L') (i.e., mean variation of the gear ratio (L) over a period (T) of a plurality of unit time intervals (t_i)) is controlled to lie between a first threshold value (S_1) that is negative and a second threshold value (S_2) that is positive, wherein the mean variation per unit time (L') has an absolute value of more than zero for the duration of at least one operating stage in the permanent mode; and in the transient mode, the sliding mean variation per unit time (L') of the gear ratio (L) is controlled to lie outside the range of values defined by the first and second threshold value (S_1, S_2).

Accordingly, claim 14 has been amended to replace “the operating stage” by “the at least one operating stage.” Also, claim 14 has been clarified by reciting that the mean variation (L’) of the gear ratio has a fixed value during the at least one operating stage in the permanent mode.

Further, new claims 19-20 have been added. Claim 19 depends on claim 1 and recites that the mean variation (L’) of the gear ratio has a fixed value during each operating stage in the permanent mode. Claim 20 corresponds to claim 14 except that it depends on claim 19 and “the at least one operating stage” is replaced by “each operating stage.”

Support for the added recitations is found throughout the original application, in particular, it is immediately derived from page 9, lines 24-32 and Fig. 2.

Claims 1-20 are pending in the present application. Claim 1 is the only independent claim.

I. Obviousness rejection based on Osanai

In the Office Action dated December 17, 2007, claims 1-18 are rejected under 35 U.S.C. 103(a) as obvious over U.S. Patent No. 4,704,683 to Osanai (“Osanai”) in view of U.S. Patent No. 6,188,946 to Suzuki et al. (“Suzuki”).

Reconsideration and withdrawal of the rejection is respectfully requested. Osanai is completely silent regarding the permanent mode with non-zero mean variation. Specifically, Osanai discloses a stepped gear ratio with fixed gear ratio during permanent phases and rapidly changing gear ratio during transition phases, as illustrated on Figure 2 of Osanai. This is particularly visible by the second curve from the top on Fig. 2 of Osanai, which shows a “speed ratio” curve. In Osanai, the permanent modes are the periods with the horizontal lines (no

adjustment of the speed ratio, i.e., this corresponds precisely to the fixed gear ratio of a manual gear box) and the transient modes are the periods with the steep lines (quick change in the speed ratio).

Further, Suzuki does not remedy the deficiencies of Osanai. Specifically, Suzuki imposes an upshift prohibition zone (see Fig. 3 of Suzuki) at low speed values to facilitate starting on an uphill or in low friction conditions. Fig. 4 of Suzuki shows the variation of the relevant parameters with time. Thus, i_p^* is the target upshift threshold of the speed ratio (see col. 4, line 50 of Suzuki), which is adjusted at time t_{spin} to take into account low friction conditions. This threshold i_p^* is then adjusted progressively (i.e., reduced, as shown on Fig. 4 of Suzuki) until it becomes fixed when the vehicle stands still again at time t_3 . The routine of Suzuki adjusts the minimum speed ratio threshold value i_p^* with time (see the time period t_1 - t_2 on Fig. 4), but the speed of variation of the speed ratio itself i_p is not controlled, i.e., the variation of the speed ratio i_p could be very sudden (as shown just after t_1 on Fig. 4 of Suzuki).

In contrast, the present invention defines threshold values (S_1) and (S_2) as recited in present claim 1, and the mean variation of the gear ratio over a period of several unit time intervals “is controlled to lie between a first threshold value (S_1) that is negative and a second threshold value (S_2) that is positive” in a permanent mode and “is controlled to lie outside the range of values defined by the first and second threshold value (S_1 , S_2)” in a transient mode, as recited in present claim 1.

Thus, in particular, in the presently claimed invention, “the mean variation per unit time (L’) has an absolute value of more than zero for the duration of at least one operating stage in the permanent mode,” as recited in present claim 1.

These features of the presently claimed invention are not taught or suggested in Suzuki, which is limited to a fixed gear ratio during the entire permanent mode, i.e., a mean variation of the gear ratio of zero.

In view of the above, it is submitted that the rejection should be withdrawn.

II. Obviousness rejections based on Nakawaki

In the Office Action dated December 17, 2007, claims 1-3 are rejected under 35 U.S.C. 103(a) as obvious over U.S. Patent No. 4,836,056 to Nakawaki et al. (“Nakawaki”) in view of U.S. Patent No. 6,188,946 to Suzuki et al. (“Suzuki”).

Further, claims 10-13 are rejected under 35 U.S.C. 103(a) as obvious over Osanai in view of Suzuki and further in view of Nakawaki, claim 16 is rejected under 35 U.S.C. 103(a) [the Office Action indicates section 102(b) but this is understood as a typographical error] as obvious over Osanai in view of Suzuki and further in view of Nakawaki, and claims 17-18 are rejected under 35 U.S.C. 103(a) as obvious over Osanai in view of Suzuki and further in view of FR 3,789,683 to Guichard et al. (“Guichard”).

Reconsideration and withdrawal of the rejections is respectfully requested. As explained above in Part I, Suzuki is completely silent regarding threshold values (S_1) and (S_2) as recited in present claim 1, and the mean variation of the gear ratio over a period of several unit time intervals “is controlled to lie between a first threshold value (S_1) that is negative and a second

threshold value (S_2) that is positive” in a permanent mode and “is controlled to lie outside the range of values defined by the first and second threshold value (S_1, S_2)” in a transient mode, as recited in present claim 1. Thus, in particular, in the presently claimed invention, “the mean variation per unit time (L') has an absolute value of more than zero for the duration of at least one operating stage in the permanent mode,” as recited in present claim 1. As a result, Suzuki, which is limited to a fixed gear ratio during the entire permanent mode, i.e., a mean variation of the gear ratio of zero, fails to remedy the deficiencies of the other cited references.

In particular, by comparing Fig. 3 of Suzuki with Fig. 9 of Nakawaki, it is observed that Fig. 9 of Nakawaki shows a map of the gear ratio similar to Fig. 3 of Suzuki, with the additional indication of the permanent stages (gear ratio follows straight lines passing through zero, i.e., speed ratio is fixed) and transient stages (speed ratio goes from one of these straight lines to another, for example, r_2 to r_3). The routine of Suzuki adjusts the value ip^* with time (see the time period $ts1-t2$ on Fig. 4), but the speed of variation of the speed ratio itself ip is not controlled, i.e., the variation of the speed ratio ip could be very sudden (as shown just after $ts1$ on Fig. 4 of Suzuki).

Thus, Suzuki is consistent with keeping permanent stages and transient stages as in Nakawaki (or as in Osanai), i.e., with a fixed speed ratio during the permanent stages. As a result, Suzuki fails to suggest or provide any incentive or motivation to modify the permanent stages of Nakawaki (or Osanai), according to which the mean variation of the gear ratio is zero in the permanent stage.

In view of the above, it is submitted that the rejections should be withdrawn.

Amendment
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Conclusion

In conclusion, the invention as presently claimed is patentable. It is believed that the claims are in allowable condition and a notice to that effect is earnestly requested.

A personal interview to be held during the suspension period is respectfully requested. Please contact the undersigned attorney at the telephone number listed below.

In the event this paper is not considered to be timely filed, the Applicants hereby petition for an appropriate extension of the response period. Please charge the fee for such extension and any other fees which may be required to our Deposit Account No. 502759.

Respectfully submitted,

/nicolas seckel/

Nicolas E. Seckel
Attorney for Applicants
Reg. No. 44,373

Nicolas E. Seckel
Patent Attorney
1250 Connecticut Avenue NW Suite 700
Washington, DC 20036
Tel: (202) 669-5169
Fax: (202) 822-1257
Customer No.: 29980
NES/rep